the Advanced Yield Nursery in 2011. Based on its performance, it was advanced to the Kansas Intrastate Nursery in 2012, 2013, and 2014. It also was entered in the 2013 and 2014 Southern Regional Performance Nurseries. KS030887K-6 was released as KanMark in July 2014.

Agronomic characteristics. KanMark is a white-chaffed, semi-dwarf hard winter wheat, most closely resembling Jagalene. It is medium-short in height with above-average straw strength and excellent yield potential (Tables 1 and 2). KanMark is medium maturing, heading about three days later than Everest. KanMark has a test weight pattern superior to Tiger, a hard white winter wheat adapted to western Kansas with good test weight patterns. KanMark has good winter hardiness and a medium coleoptile length. KanMark is moderately susceptible to acid soils and has not been observed to shatter.

Resistance to pests. KanMark is resistant to the currently prevalent races of leaf and stripe rust in the Great Plains (Table 3). Though its pedigree contains parents carrying race nonspecific rust resistance believed to be durable, there is no strong evidence for the presence of race nonspecific resistance in KanMark. It is resistant to soil-borne mosaic virus and spindle streak mosaic virus. It is moderately resistant to stem rust, moderately susceptible to powdery mildew, and susceptible to Hessian fly and Fusarium head blight.

Area of adaptation. KanMark has performed well across Kansas, with its strongest performance under dryland production in western Kansas and in irrigated environments. It is believed to have excellent tolerance to moderate drought conditions. KanMark has performed well in central Kansas but is moderately susceptible to acid soils and susceptible to Fusarium head blight, which may limit its production in this area. It is expected to perform better in north central Kansas than south central Kansas; however, it is not recommended for eastern Kansas due to its Fusarium head blight reaction.

Milling and baking quality. KanMark has good milling quality and good-to-excellent baking quality. The flour extraction rates of KanMark have generally ranged from acceptable to good, with its thousand kernel weight being more variable than would be desired. The flour protein content is generally about 0.5 percent higher than Danby, a hard white winter wheat adapted to western Kansas with acceptable protein content and baking quality. In four years of bake tests, KanMark has had longer mix times and tolerances, as well as slightly higher loaf volumes than Danby. The loaf volume of KanMark is approximately 100 cc greater than that of Everest. Bake absorptions have been similar to Danby.

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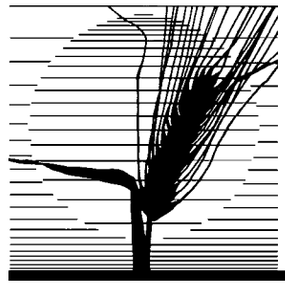

KanMark Hard Red Winter Wheat

KanMark is a new hard red winter wheat variety developed by the Kansas Agricultural Experiment Station and the USDA Agricultural Research Service. Foundation seed of KanMark was distributed to Kansas registered seed growers for planting in 2014. Foundation and registered seed will be available for fall planting in 2015. KanMark is named for Mark A. Carleton. An early plant explorer, Carleton introduced the materials that led to the foundation of the U.S. durum wheat industry and brought new winter hardy landraces of wheat to Kansas. He is credited with developing Kanred, the first improved hard red winter wheat released by Kansas State University.

Origin and development. KanMark is a hard red winter wheat selected from the cross Parula/2*Pastor//G980129W/3/KS970104-3-13. The pedigree of G980129W is CG14106/Karl 92 and the pedigree of KS970104-3-13 is 2145//KS93WGRC27/Karl 92/3/TAM-200/KS831943//X82110I-2. Parula and Pastor are spring wheat varieties released by CIMMYT, while Karl 92 and 2145 are hard red winter wheats released by the Kansas Agricultural Experiment Station. KS93WGRC27 is a germplasm line released by the Wheat Genetics Resource Center as a source of resistance to wheat streak mosaic. The pedigree of KS93WGRC27 is Karl*4/CI17884. Karl is a hard red winter wheat released by the Kansas Agricultural Experiment Station and from which

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Karl 92 was reselected. CI17884 is an *Agropyron intermedium* accession. TAM 200 is a hard red winter wheat released by the Texas Agricultural Experiment Station. The pedigrees of CG14106, KS831943 and X82110I-2 are not known. The three-way cross was made in the spring of 2003. F_1 plants were grown in the fall of 2003, harvested in bulk, and F_2 seed was planted in the field in the fall of 2004. The F_2 population was grown at Manhattan, Kansas, in 2005, the F_3 seed at Castroville, Texas, and Hutchinson, Kansas, in 2006, the F_4 at Dighton, Kansas, and Manhattan, Kansas, in 2007, and the F_5 at Manhattan, Kansas, and Hutchinson, Kansas, in 2008. Seeds from selected plants in the F_2, F_3 and F_4 were bulked to form the source seed for the subsequent generation. Based on yield, the phenology, agronomic traits and quality data, KS030887K-6 was selected and advanced to the 2010 Preliminary Yield Nursery. The same selection criteria were used to advance the line to

continued on back

Table 2. *Irrigated performance of KanMark and selected checks (bu/a) in western Kansas from 2012-2014.*

Variety	2012 Scott Co. Irrigated	2013 Colby Irrigated	2014 Lane Co. Irrigated	2014 Colby Irrigated	2-Yr Avg
KanMark	99.5	83.6	106	108	99.4
Clara CL	89.7	75.7			
Brawl CL+		77.2	88.4	96.2	87.3
Danby		84.4	88.5	97.2	90.0
SY-Wolf			89.9	91.9	
Antero			102.0	112	
TAM 111		77.1	94.6	94.2	88.6
WB-Grainfield				109.0	
WB-Cedar	87.1		89.2	109	
LSD (.05)*	5.9	8.5	12.3	10.0	

*Least significant difference. If the difference between two varieties is greater than the LSD value for that county, then the results are statistically different.

Table 1. *Western Kansas yield of KanMark and checks (bu/a) from 2012-2014.*

	2012					2013						2014								
Variety	Ford Co.	Pawnee Co.	Hays	Ness Co.	Osborne Co.	Graham Co.	Hays	Ness Co.	Osborne Co.	Pawnee Co.	Colby	Trego Co.	Osborne Co.	Hays	Colby	2012 Avg	2013 Avg	2014 Avg	2-Yr Avg	3-Yr Avg
KanMark	32.8	19.0	80.6	22.6	70.6	37.8	41.4	35.4	74.1	59.1	26.9	68.2	70.6	51.1	51.9	45.1	45.8	60.4	51.6	49.5
Clara CL	32.8	21.8	71.1	24.8	67.6	44.0	55.4	43.7	72.9	66.5	28.1	60.9	74.8	41.5	42.2	43.6	51.8	54.9	53.0	49.9
Danby	34.4	21.0	68.0	24.2	82.8	46.8	47.4	34.8	73.0	65.6	23.8	67.1	75.3	41.1	45.8	46.1	48.5	57.3	52.1	50.1
TAM 111						38.2	39.8	31.4	70.7	58.5	22.7	64.6	75.2	38.5	43.2		43.6	55.4	48.3	
Armour	21.4	19.2	56.4	20.2	65.8	28.2	38.8	29.6	64.6	45.8	18.2	70.6	80.8	45.6	50.6	36.6	37.5	61.9	47.3	43.7
LSD (.05)*	6.4	6	6.6	4.2	10.0	5.8	7.5	6.6	7.3	7.2	6.17	4.4	6.6	6.6	5.8					

*Least significant difference. If the difference between two varieties is greater than the LSD value for that county, then the results are statistically different.

Table 3. *Agronomic and pest resistance characteristics of KanMark[1].*

Variety	Maturity[2]	Test weight[1]	Winter hardiness	Coleoptile length[3]	Lodging resistance	Shatter resistance	Powdery mildew	Leaf rust	Stem rust	Stripe rust	Speckled leaf blotch	Tan spot	SBMV[4]	WSMV[5]	Hessian fly	Fhb[6]	BYDV[7]
KanMark	3	3	4	6	1	2	7	2	2	2	6	5	1	6	9	9	5
TAM 111	4	3	5	2	2	2	6	8	3	3	6	6	8	7	5	7	7
TAM 112	2	2	7	2	4	2	1	3	4	7	3	6	8	5	9	8	7
SY Wolf	5	2	1	5	1	1	5	1	2	5	3	3	2	6	5		6

[1] Ratings are based on 1-9 scale, 1-3 is good or resistant, 4-6 average or intermediate and 7-9 is poorest or susceptible unless otherwise noted.
[2] Maturity, 1 = earliest, 9 = latest
[3] Coleoptile ratings are based on a 1-9 scale, where 1=longest and 9=shortest.
[4] SBMV – Soilborne mosaic virus
[5] WSMV – Wheat streak mosaic virus
[6] Fhb – Fusarium head blight (Scab)
[7] BYD – Barley yellow dwarf mosaic virus